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FIG. 1

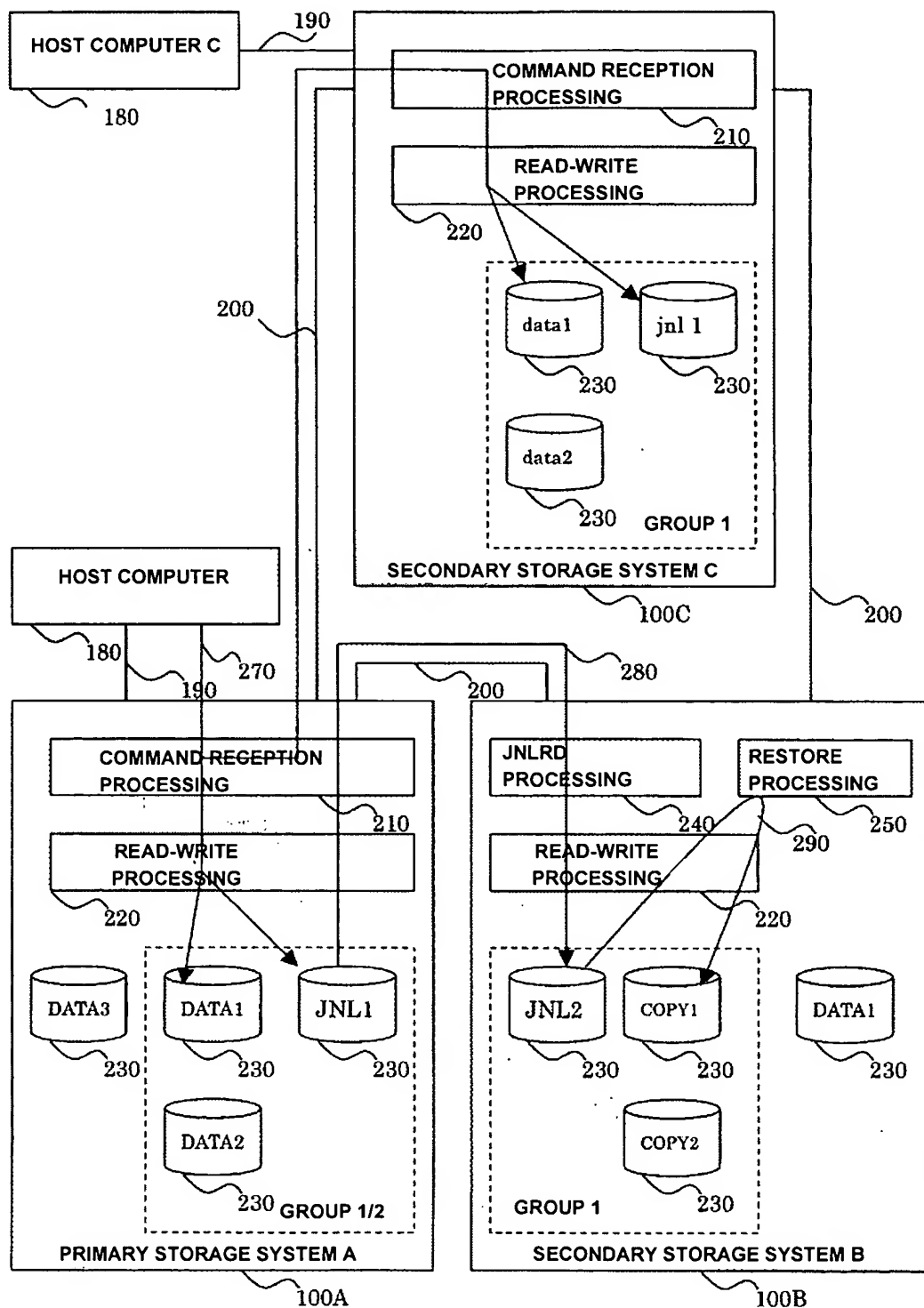


FIG. 2

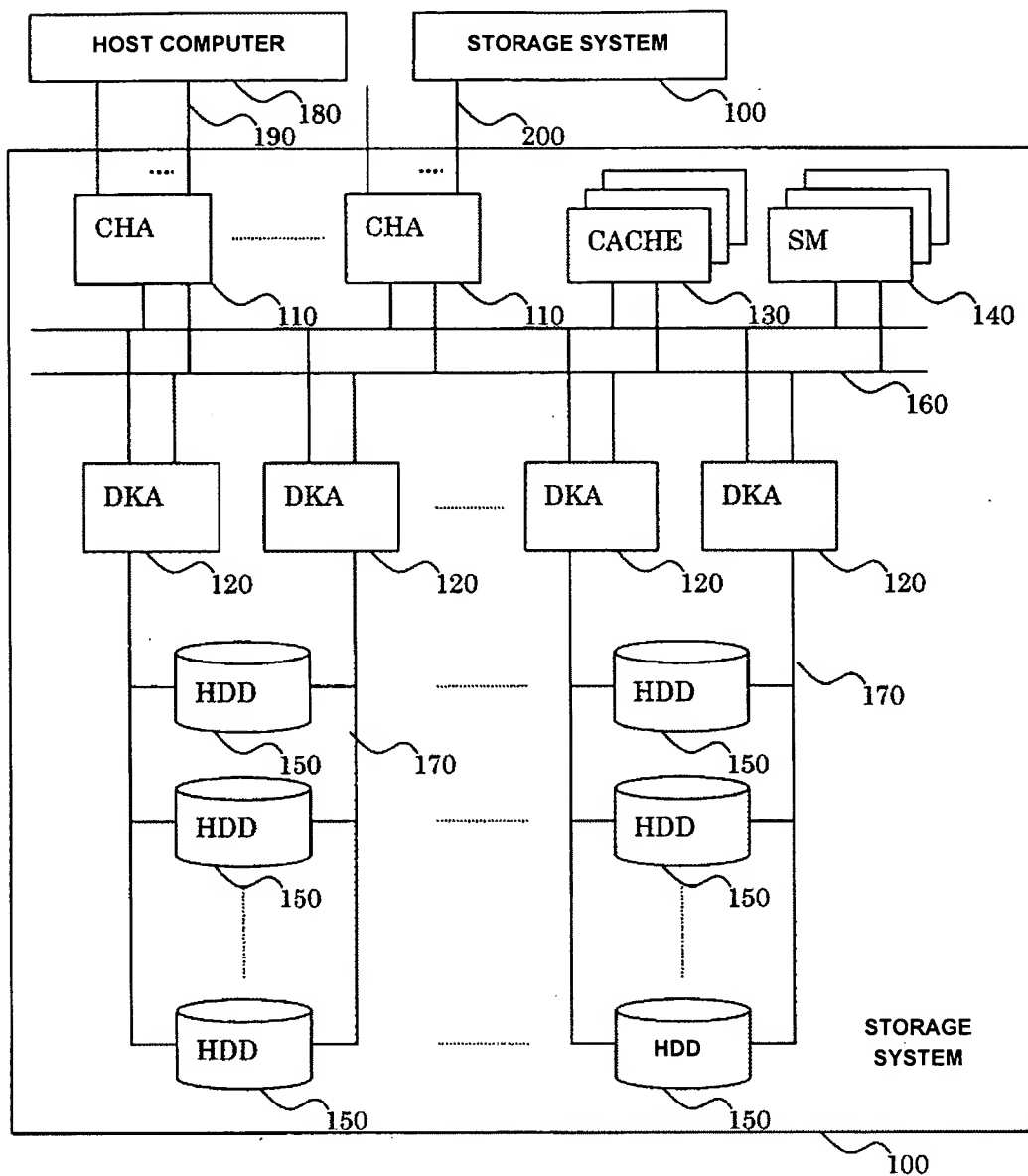


FIG. 3

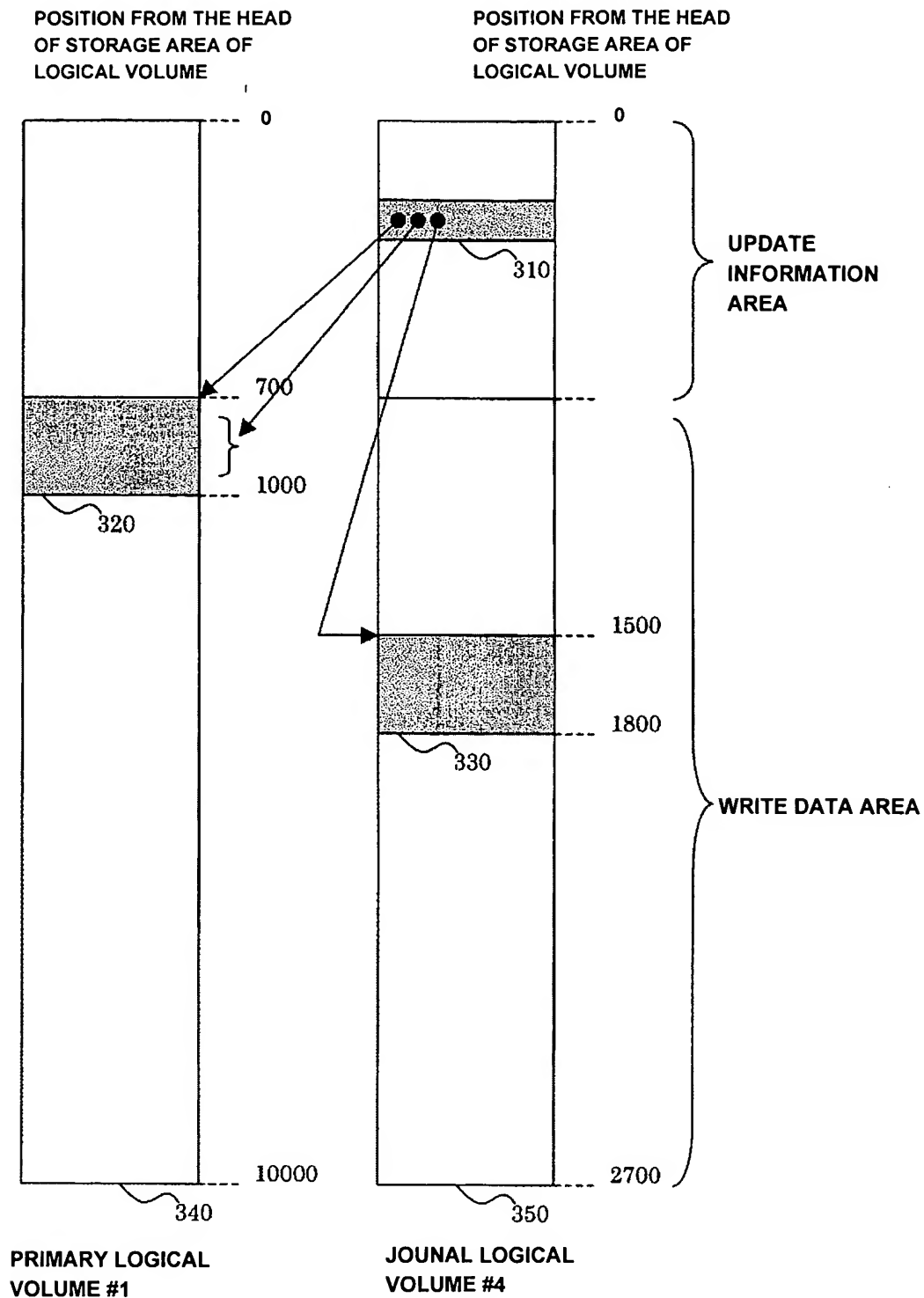


FIG. 4

LOGICAL VOLUME NUMBER	VOLUME STATE	FORMAT	CAPA- CITY	SYNC PAIR NUMBER	ASYN PAIR NUMBER	PHYSICAL ADDRESS	
						STORAGE DEVICE NUMBER	POSITION FROM THE HEAD
1	PRIMARY	OPEN3	3	3	1	1	0
2	PRIMARY	OPEN6	6	4	2	1	3
3	BLANK	OPEN6	6	0	0	1	9
4	NORMAL	OPEN9	9	0	0	2	0
5	NORMAL	OPEN3	3	0	0	2	9
6	BLANK	OPEN6	6	0	0	2	12

400 VOLUME
INFORMATION

FIG. 5

PAIR NUMBER	PAIR STATE	PRIMARY STORAGE SYSTEM NUMBER	PRIMARY LOGICAL VOLUME NUMBER	SECONDARY STORAGE SYSTEM NUMBER	SECONDARY LOGICAL VOLUME NUMBER	GROUP NUMBER	COPY COMP- LETED ADDRESS
1	NORMAL	A	1	B	1	1	0
2	NORMAL	A	2	B	2	1	0
3	NORMAL	A	1	C	1	2	0
4	NORMAL	A	2	C	2	2	0
5	BLANK	0	0	0	0	0	0

500 PAIR
INFORMATION

FIG. 6

GROUP NUMBER	GROUP STATE	PAIR SET	JOURNAL LOGICAL VOLUME NUMBER	UPDATE NUMBER	REPLI- CATION TYPE	PARTNER STORAGE SYSTEM NUMBER	PARTNER GROUP NUMBER
1	NORMAL	1,2	4	5	ASync	B	1
2	NORMAL	3,4	0	0	Sync	C	1

600 GROUP
INFORMATION

FIG. 7

	LOGICAL ADDRESS	
	LOGICAL VOLUME NUMBER	POSITION FROM THE HEAD OF STORAGE AREA OF LOGICAL
UPDATE INFORMATION AREA HEAD ADDRESS	4	0
WRITE DATA AREA HEAD ADDRESS	4	700
UPDATE INFORMATION LATEST ADDRESS	4	500
UPDATE INFORMATION OLDEST ADDRESS	4	200
WRITE DATA LATEST ADDRESS	4	2200
WRITE DATA OLDEST ADDRESS	4	1300
READ INITIATION ADDRESS	4	400
RETRY INITIATION ADDRESS	4	300

700 POINTER
INFORMATION

FIG. 8

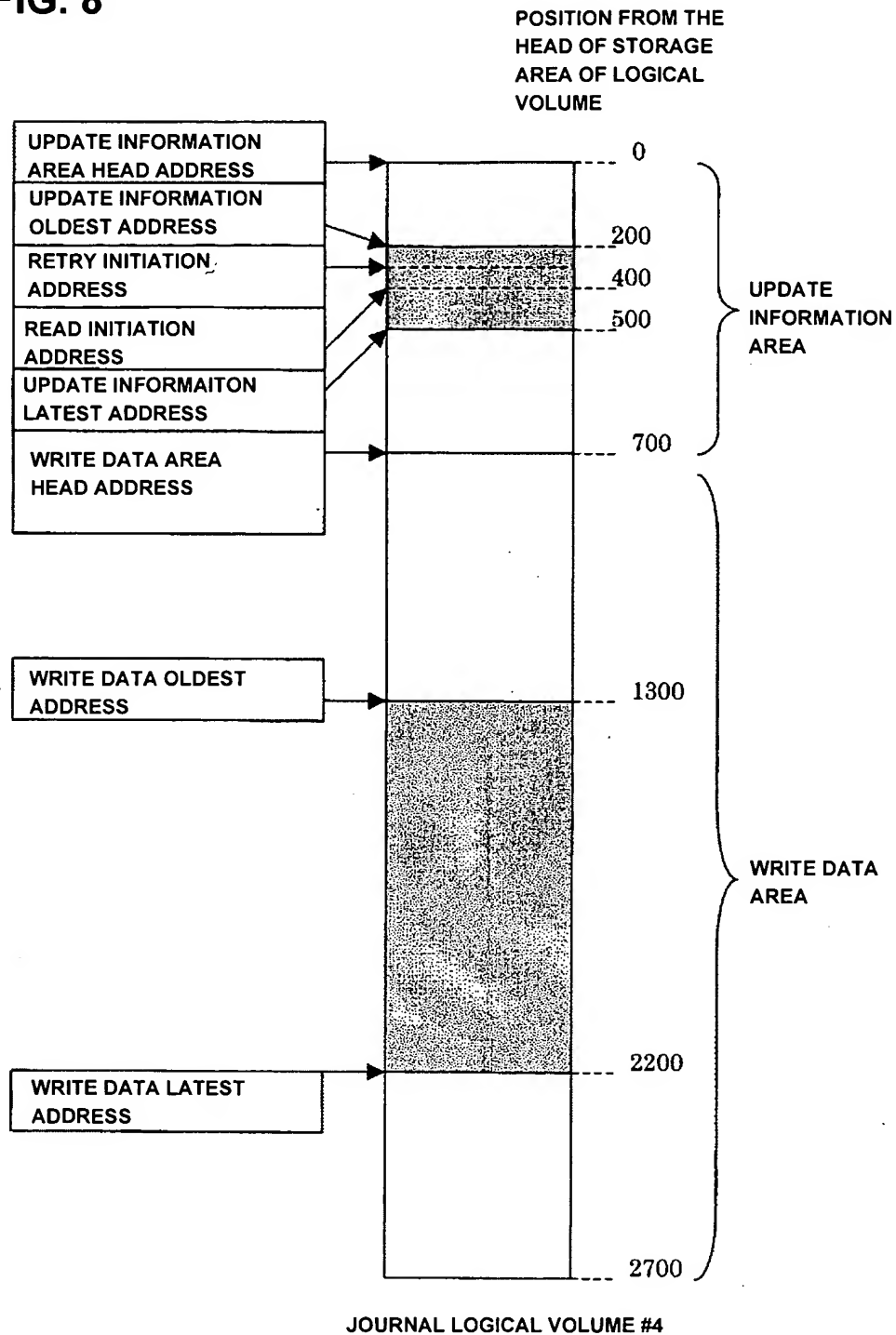


FIG. 9

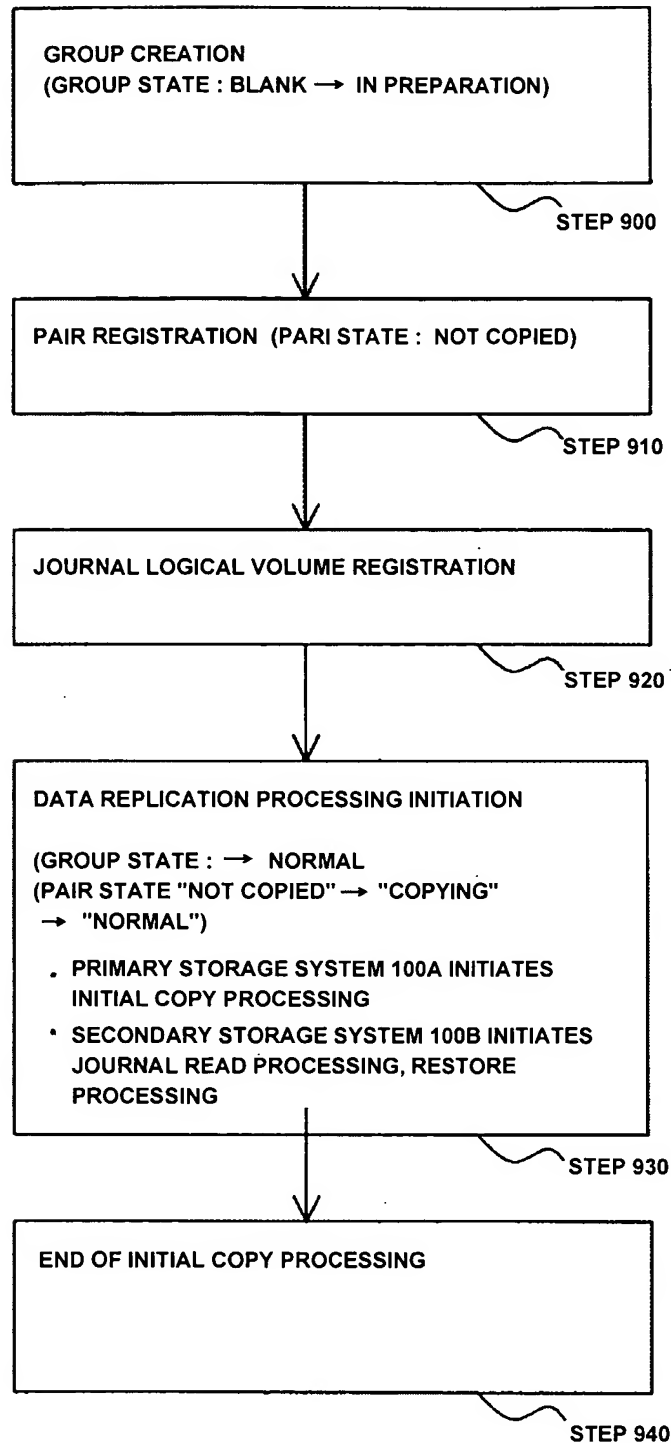


FIG. 10

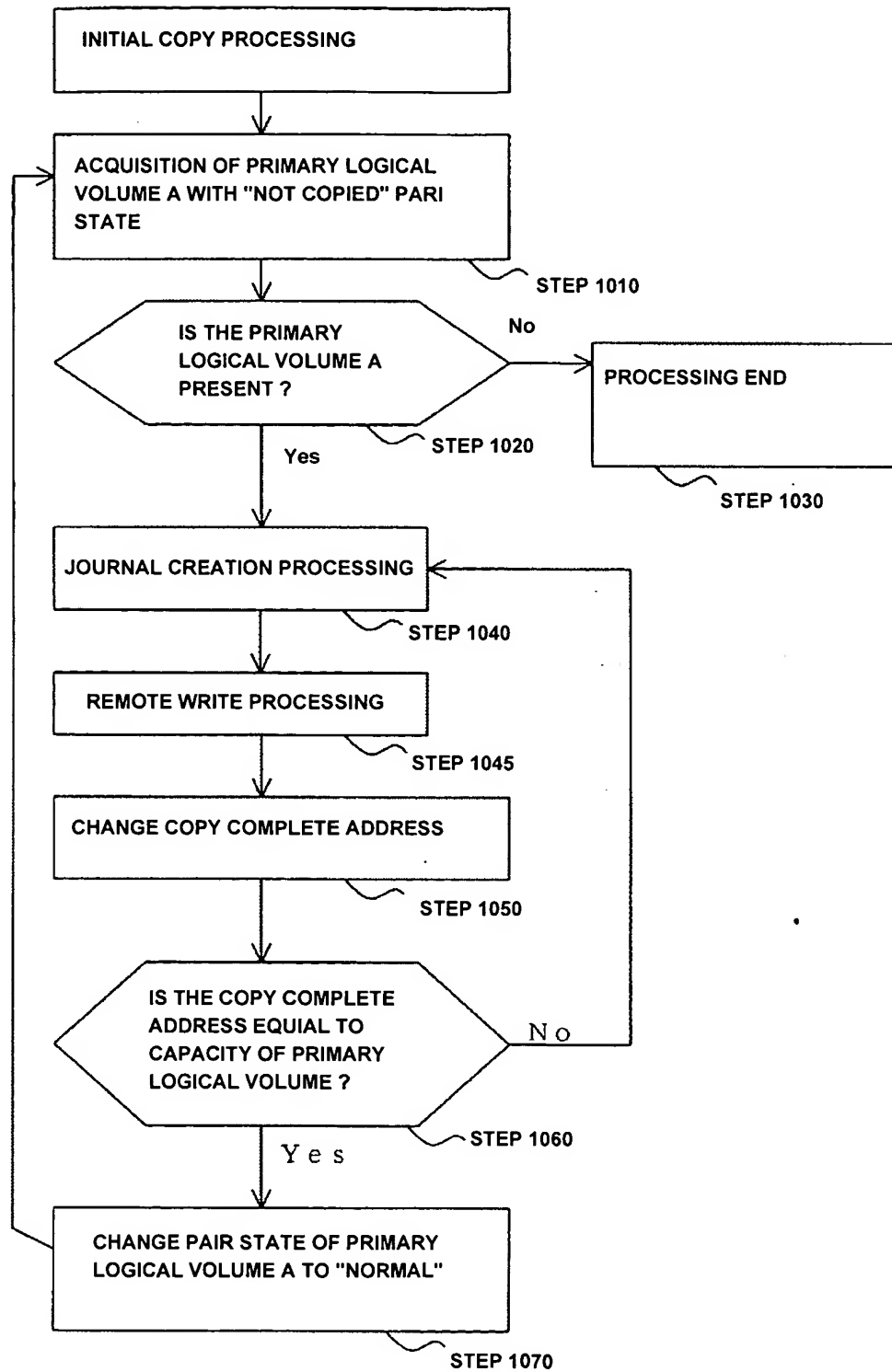


FIG. 11

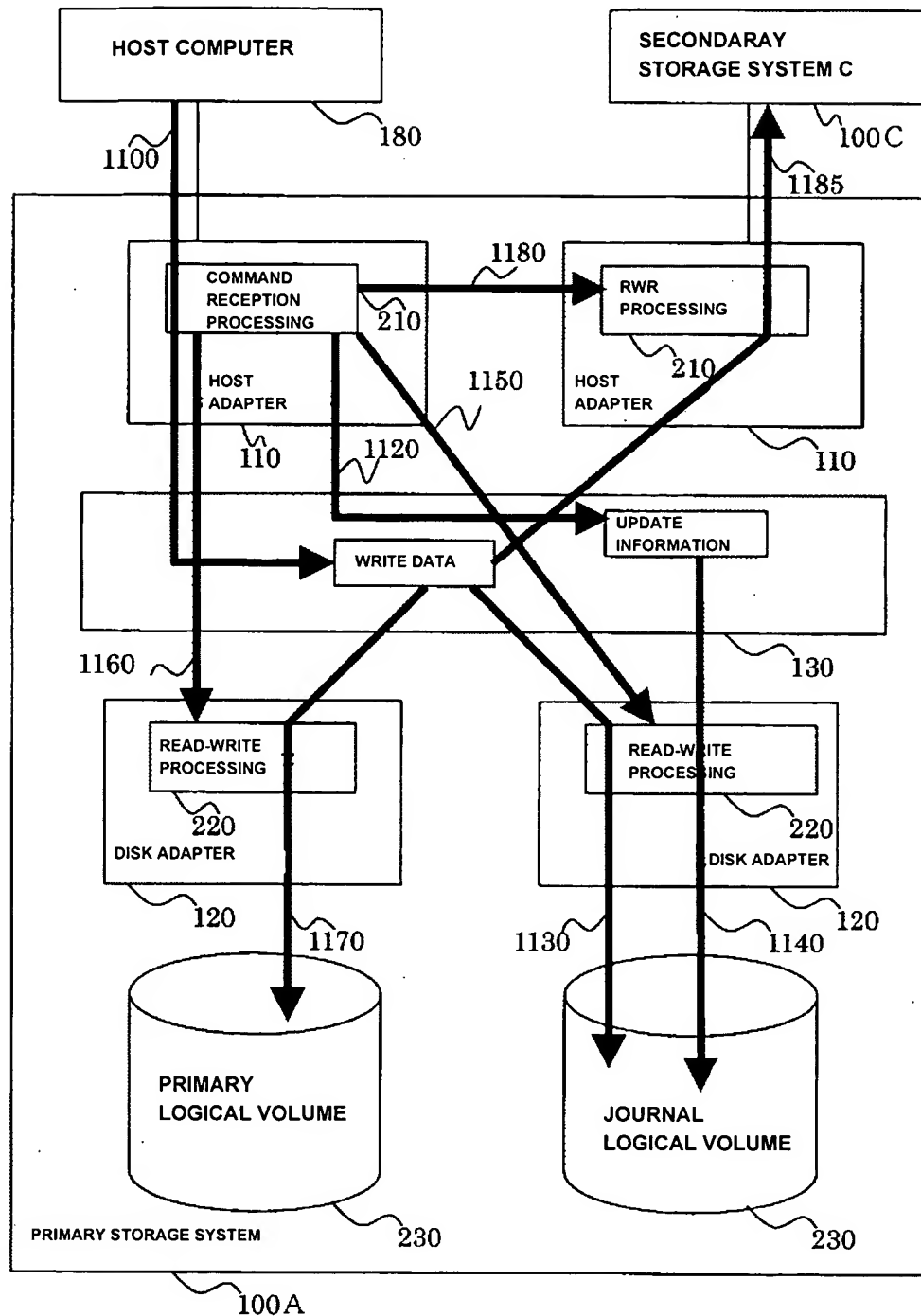


FIG. 12

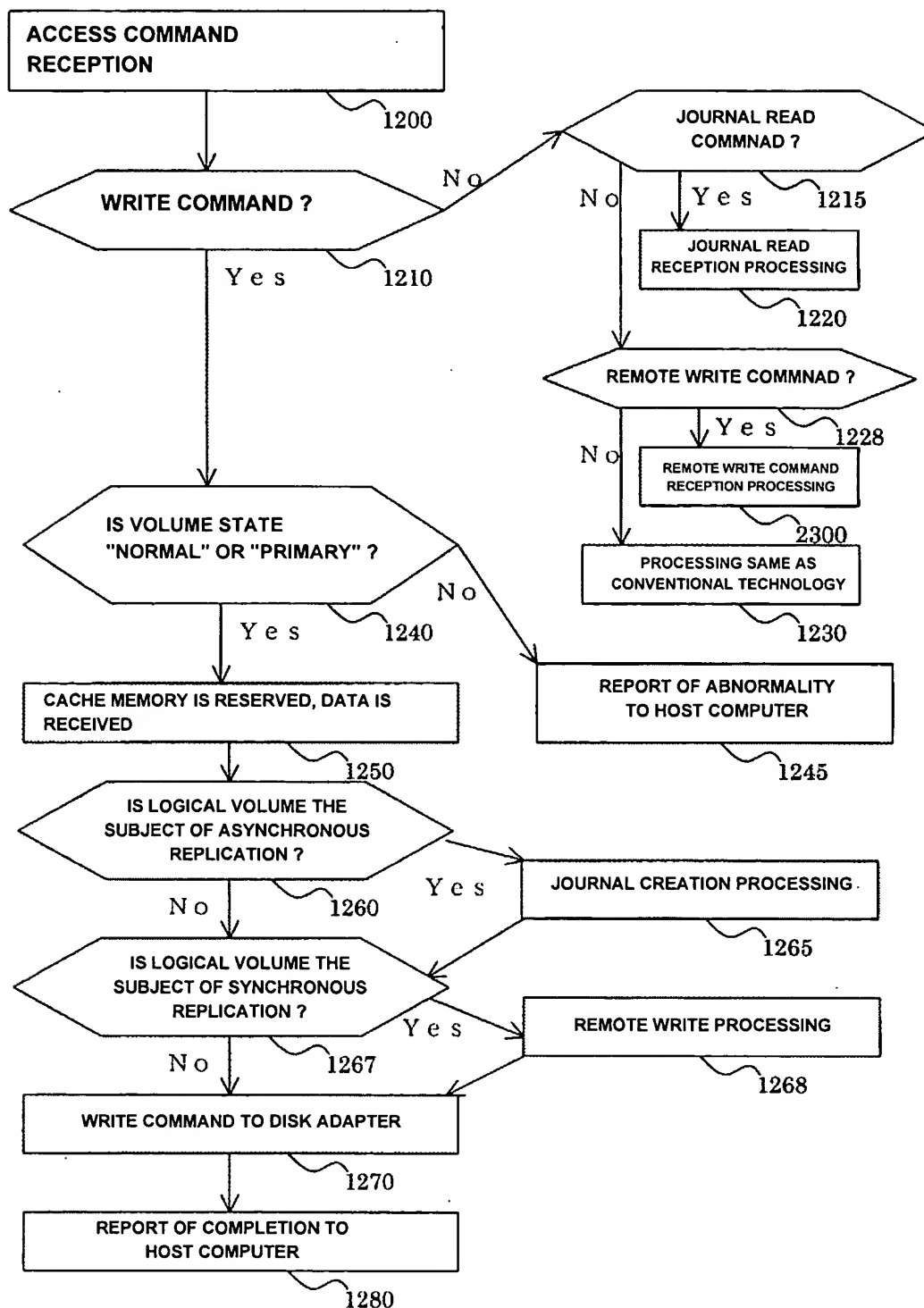


FIG. 13

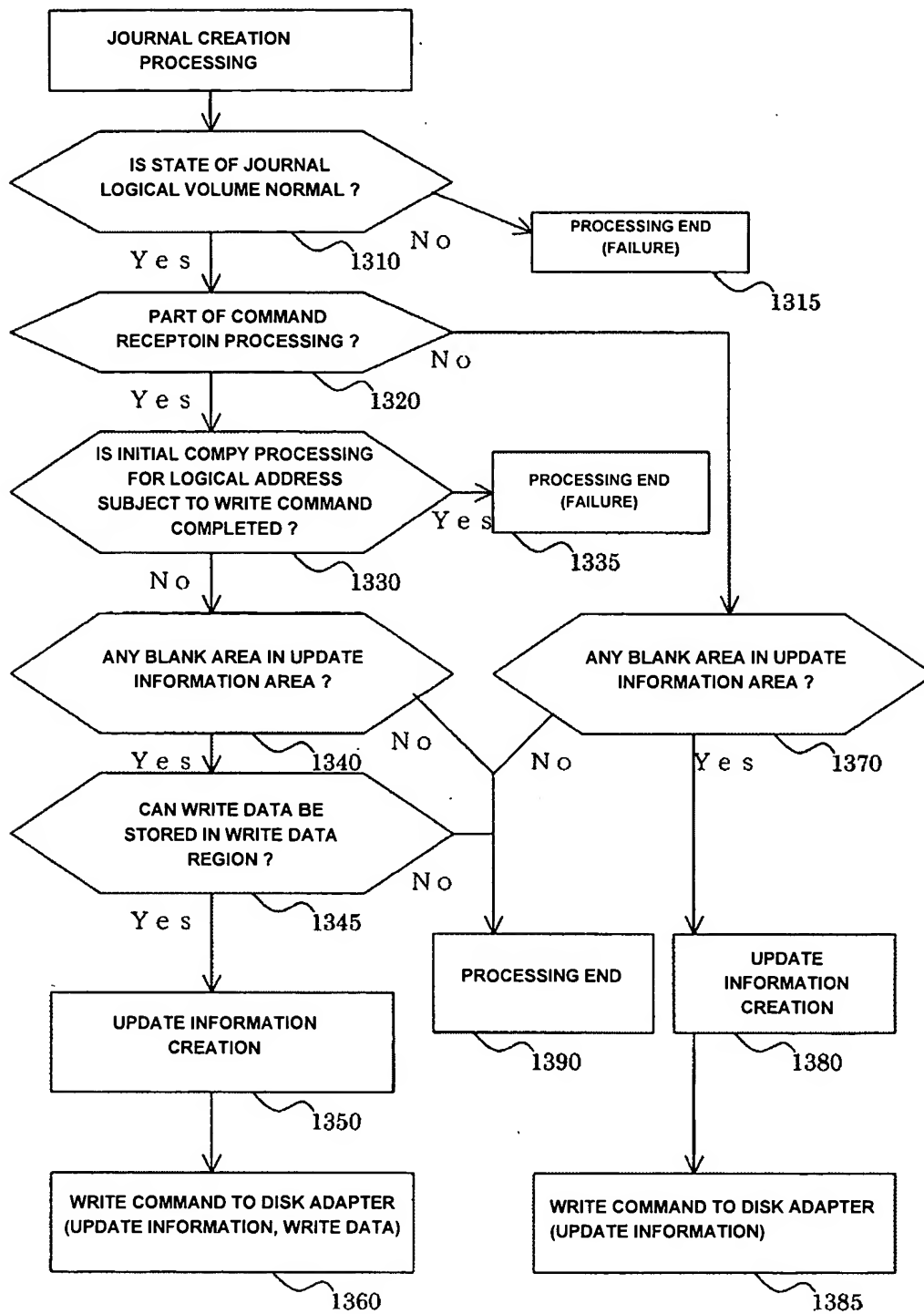


FIG. 14

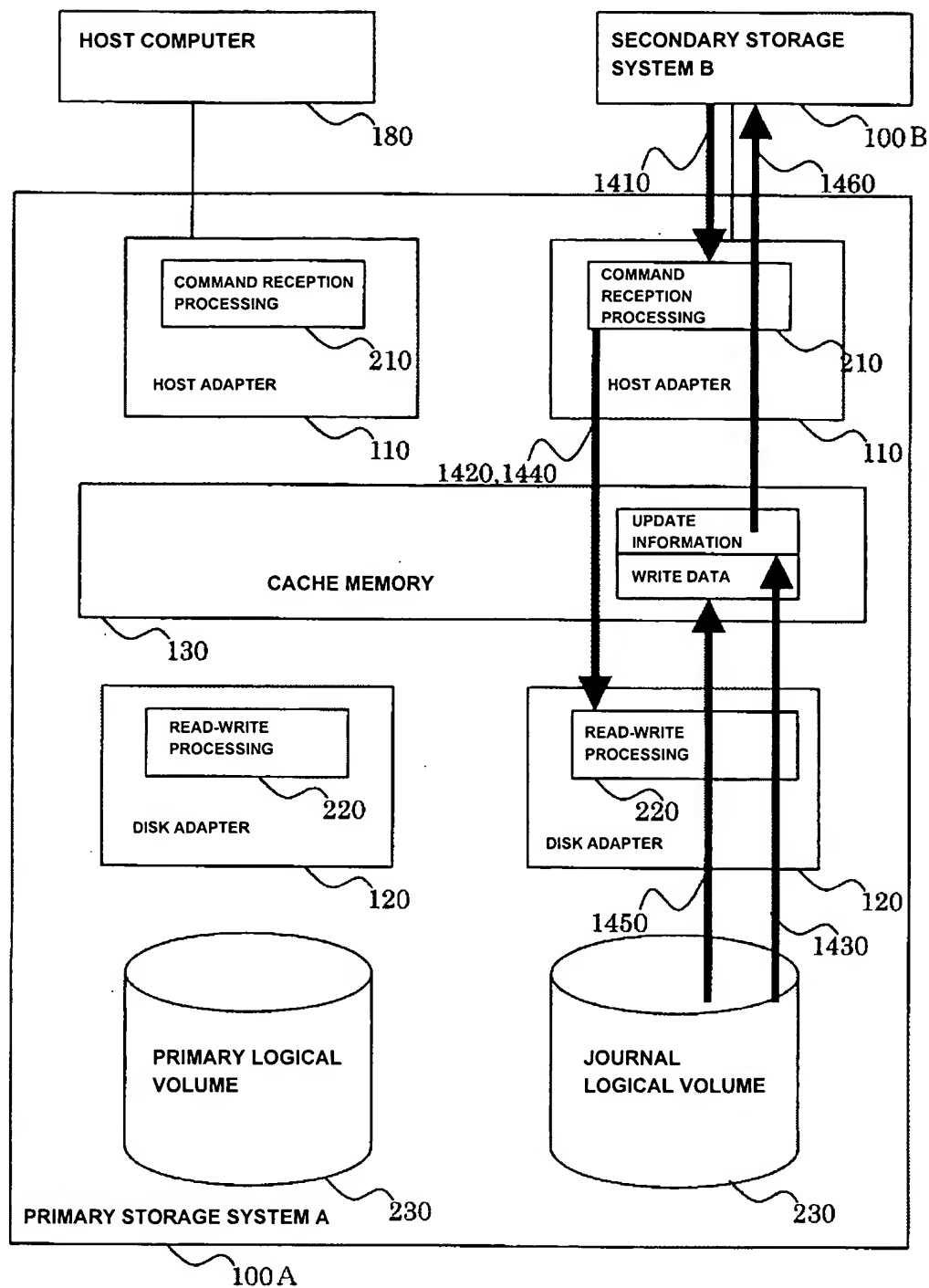


FIG. 15

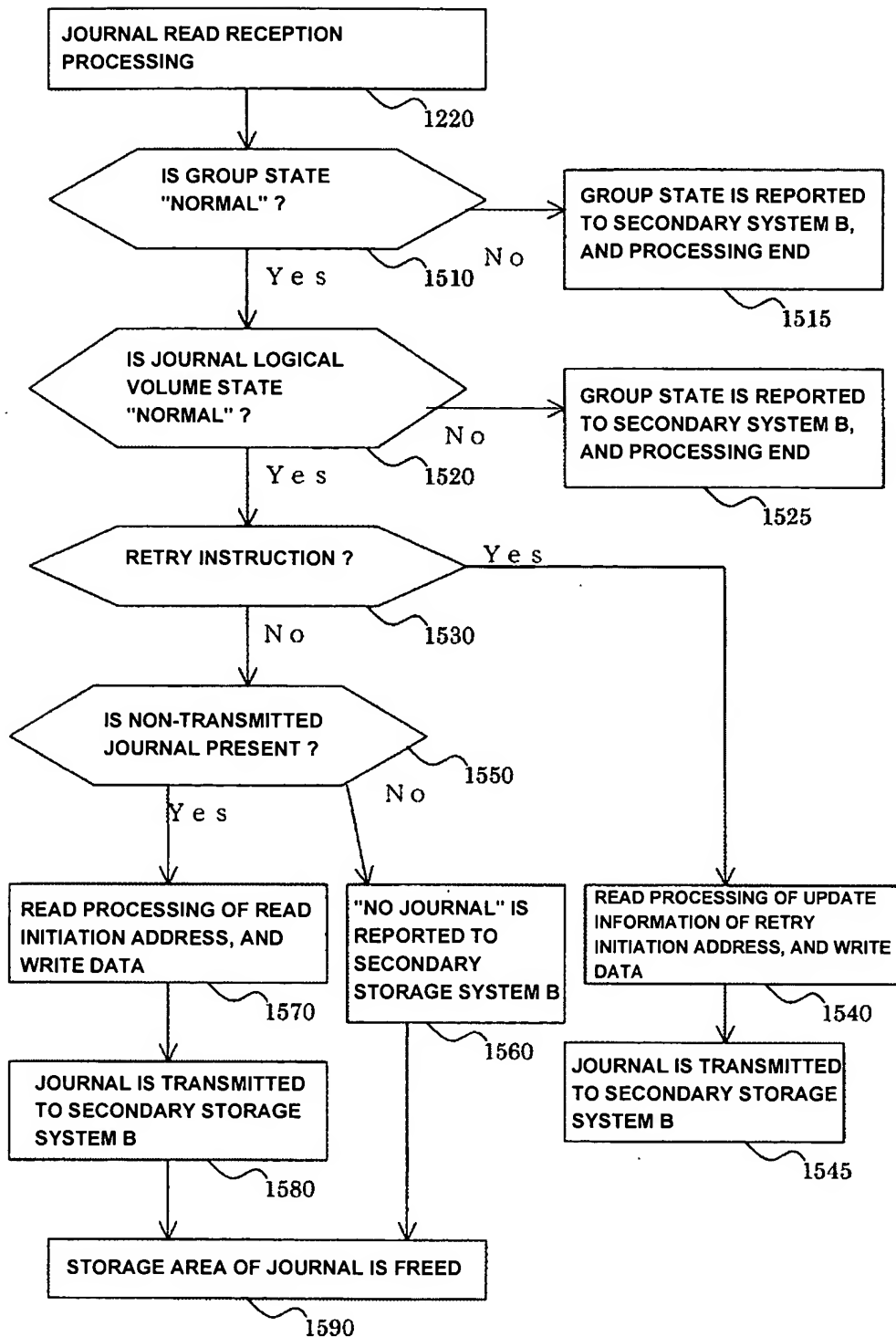


FIG. 16

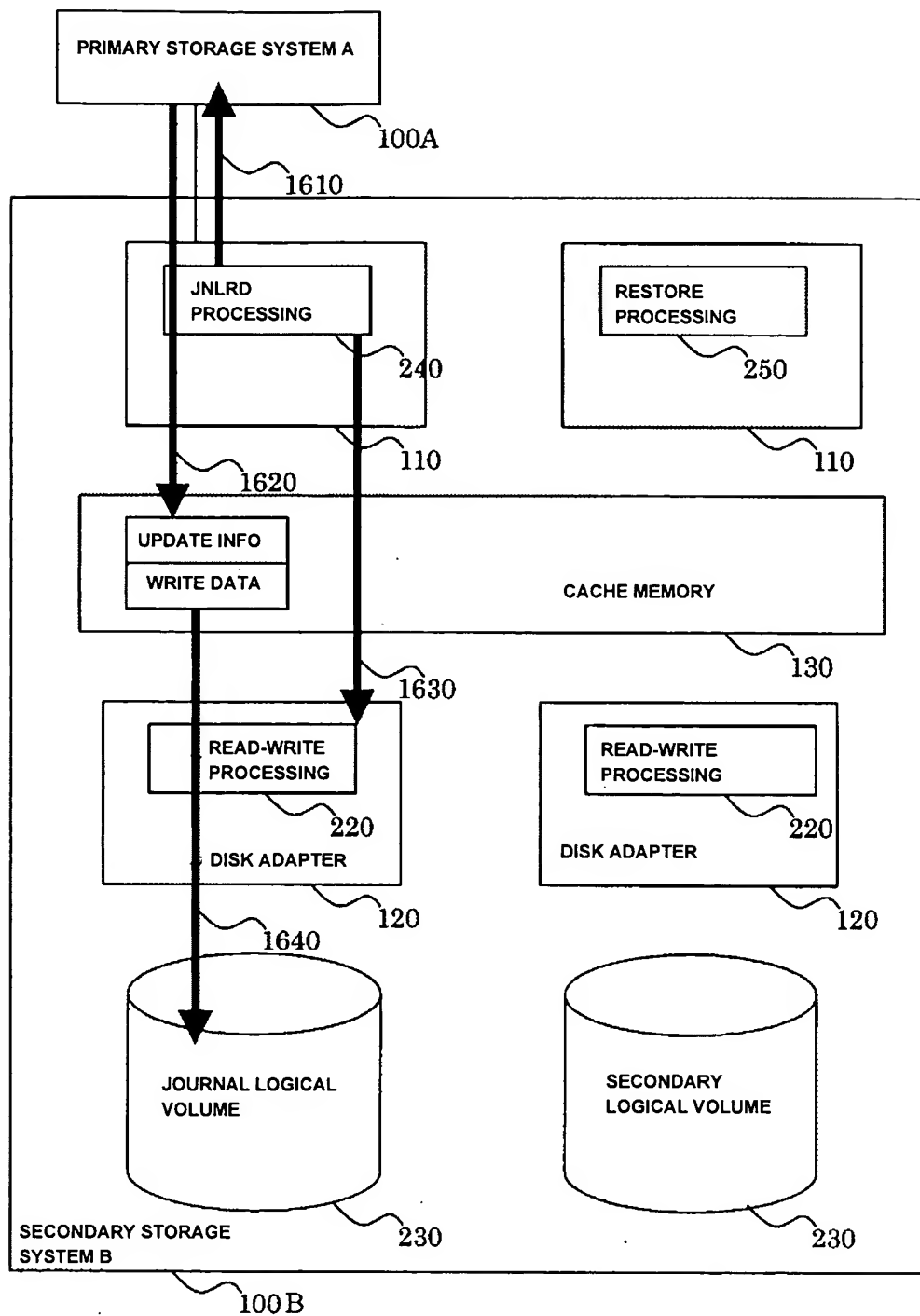


FIG. 17

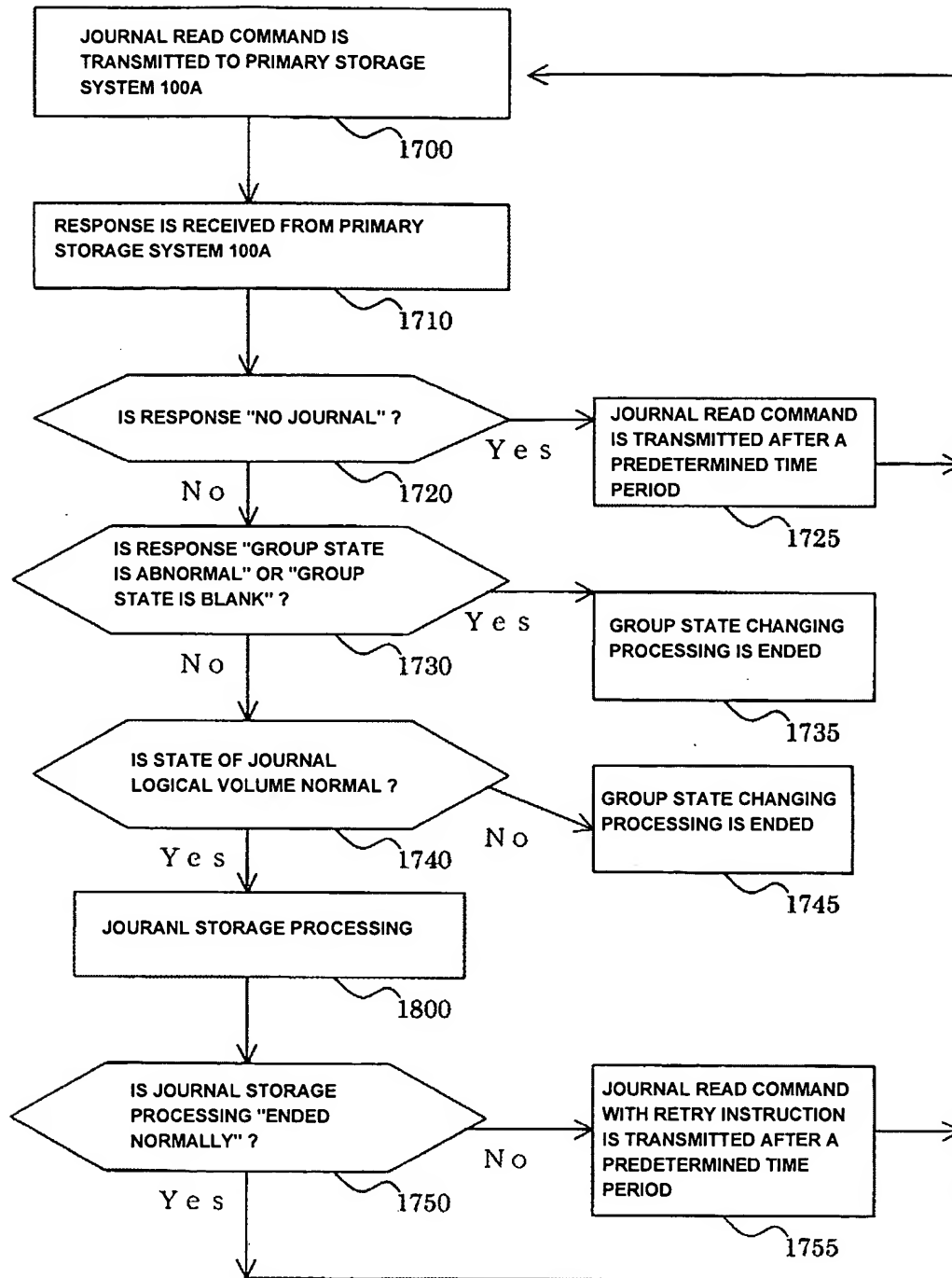


FIG. 18

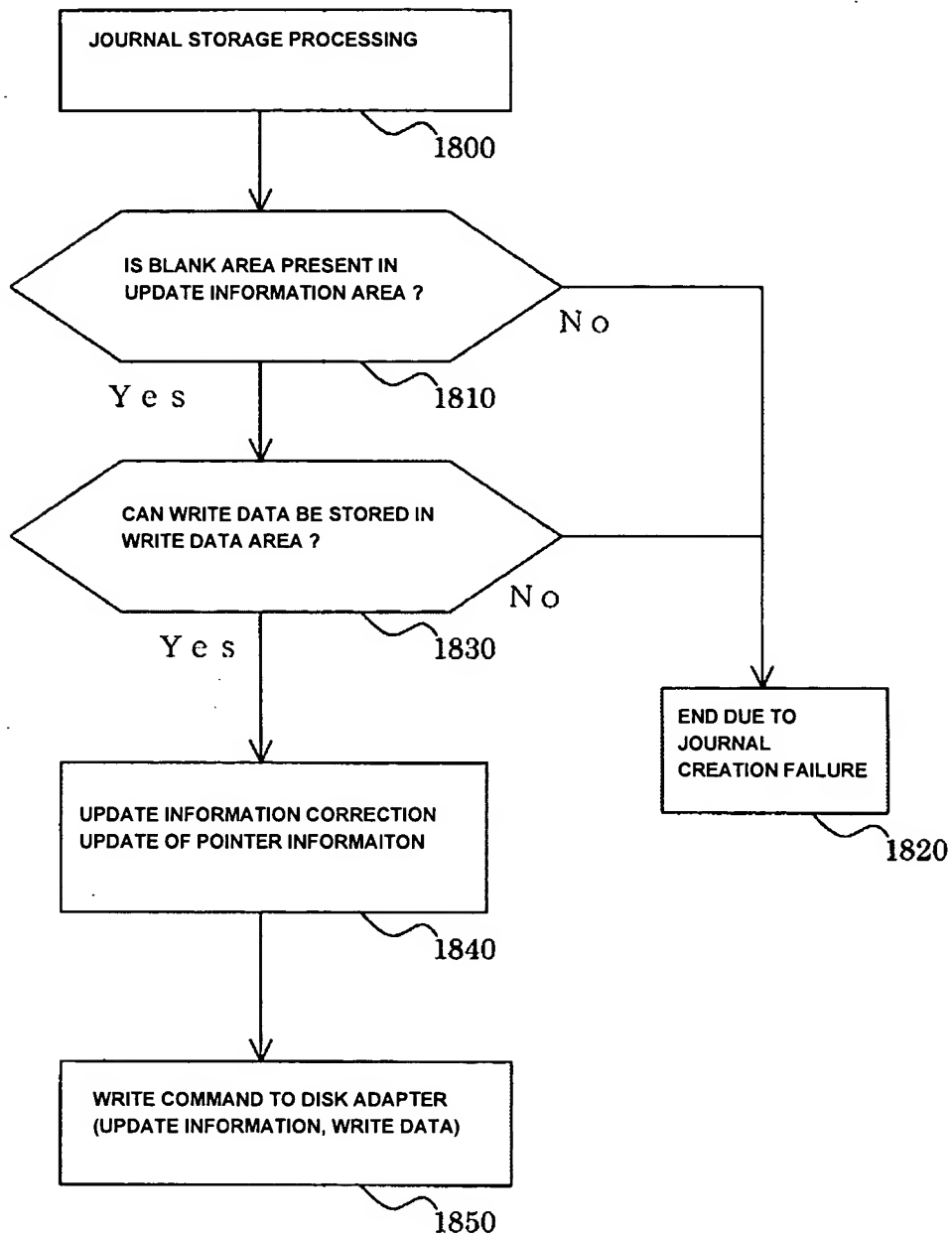


FIG. 19

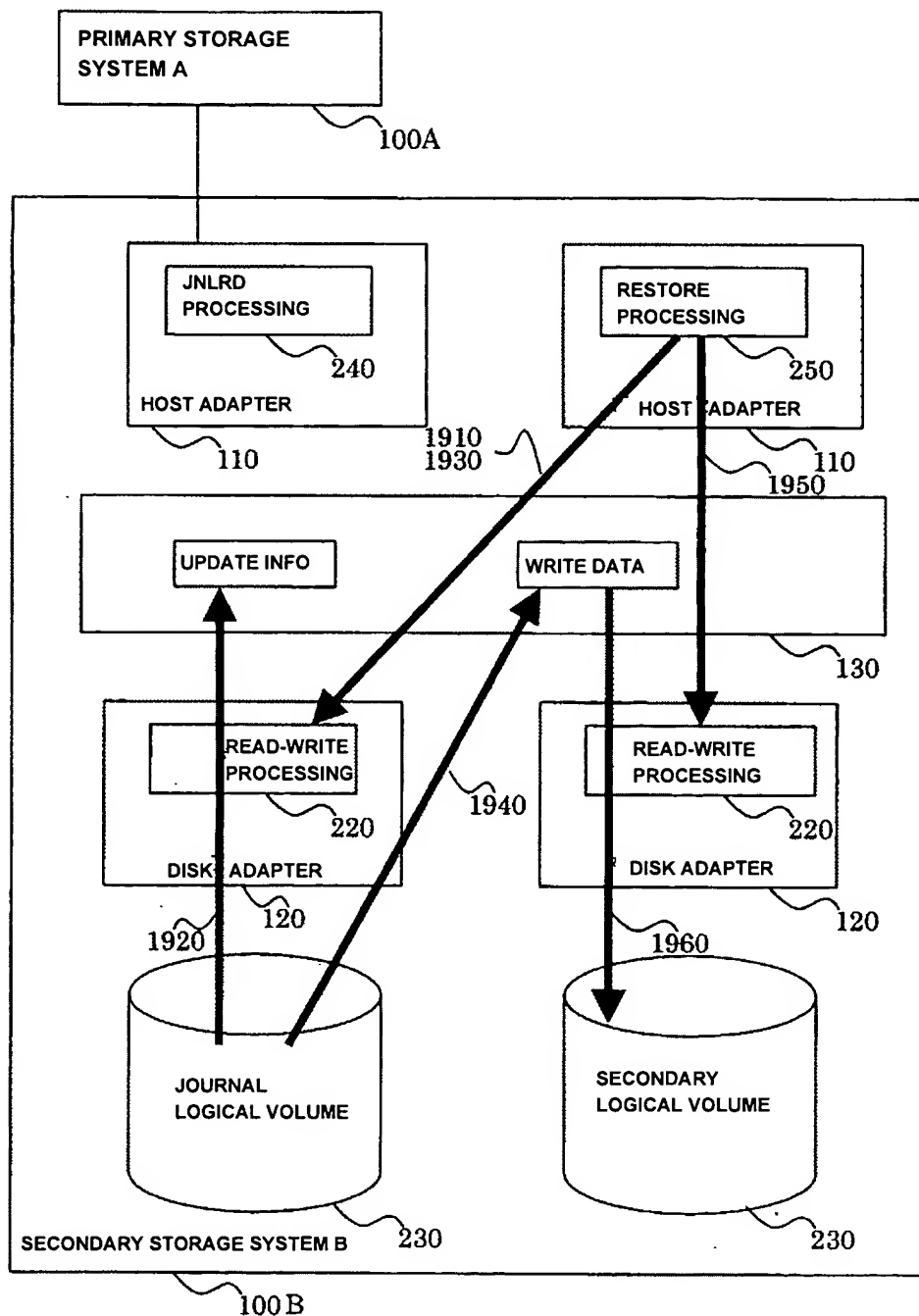


FIG. 20

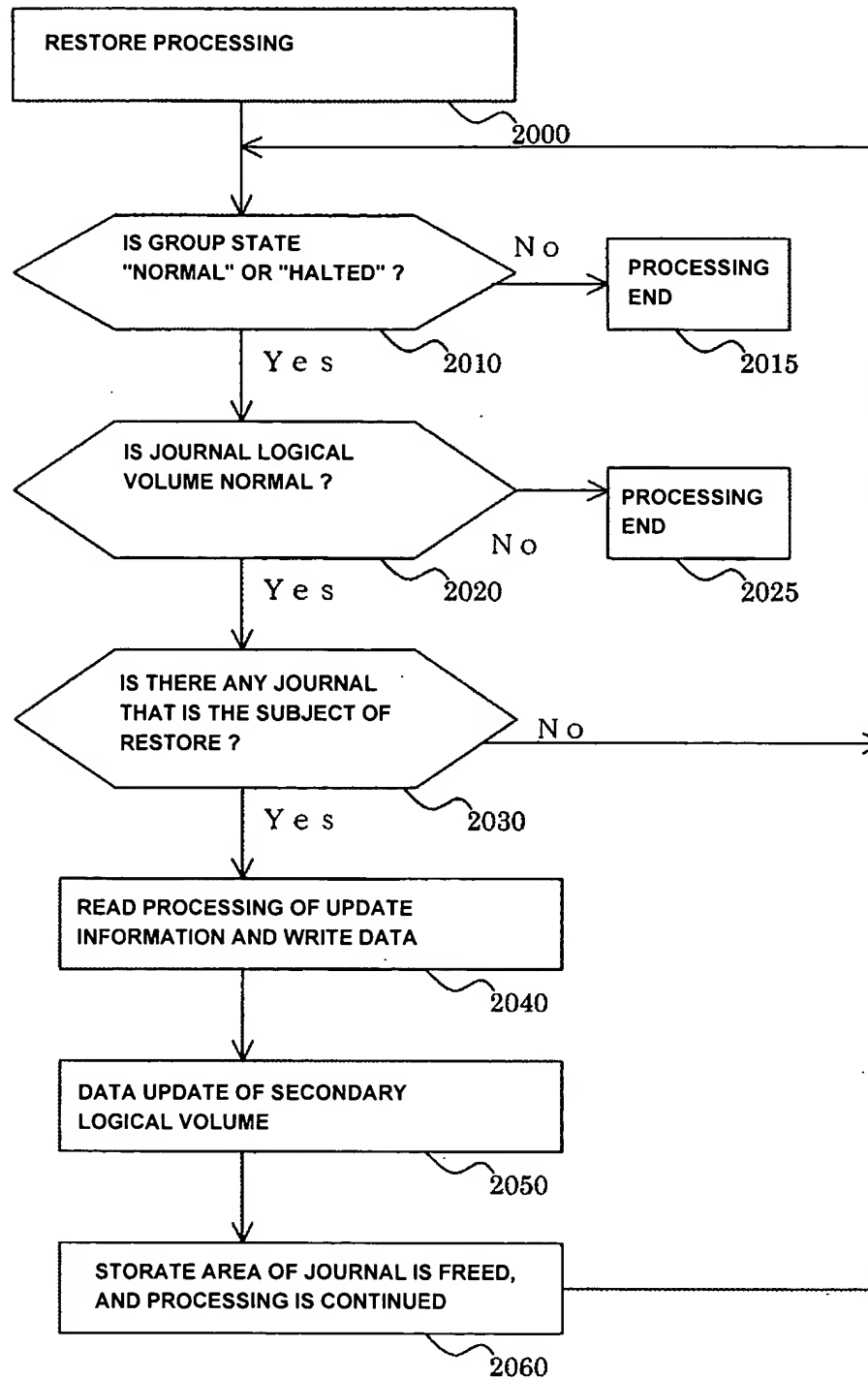


FIG. 21

SETTING ITEMS	EXAMPLE OF SET VALUES
TIME WHEN WRITE COMMAND IS RECEIVED	1999/3/17 22:20:10
GROUP NUMBER	1
UPDATE NUMBER	4
LOGICAL ADDRESS OF WRITE COMMAND	LOGICAL VOLUME NUMBER: 1 POSITION FROM HEAD OF STORAGE AREA OF LOGICAL VOLUME : 700
DATA SIZE OF WRITE DATA	300
LOGICAL ADDRESS OF JOURNAL LOGICAL VOLUME THAT STORES WRITE DATA	LOGICAL VOLUME NUMBER: 4 POSITION FROM HEAD OF STORAGE AREA OF LOGICAL VOLUME : 1500

310 UPDATE INFORMATION

FIG. 22

SETTING ITEMS	EXAMPLE OF SET VALUES
TIME WHEN WRITE COMMAND IS RECEIVED	1999/3/17 22:22:10
GROUP NUMBER	1
UPDATE NUMBER	5
LOGICAL ADDRESS OF WRITE COMMAND	LOGICAL VOLUME NUMBER: 1 POSITION FROM HEAD OF STORAGE AREA OF LOGICAL VOLUME : 800
DATA SIZE OF WRITE DATA	100
LOGICAL ADDRESS OF JOURNAL LOGICAL VOLUME THAT STORES WRITE DATA	LOGICAL VOLUME NUMBER: 4 POSITION FROM HEAD OF STORAGE AREA OF LOGICAL VOLUME : 2200

FIG. 23

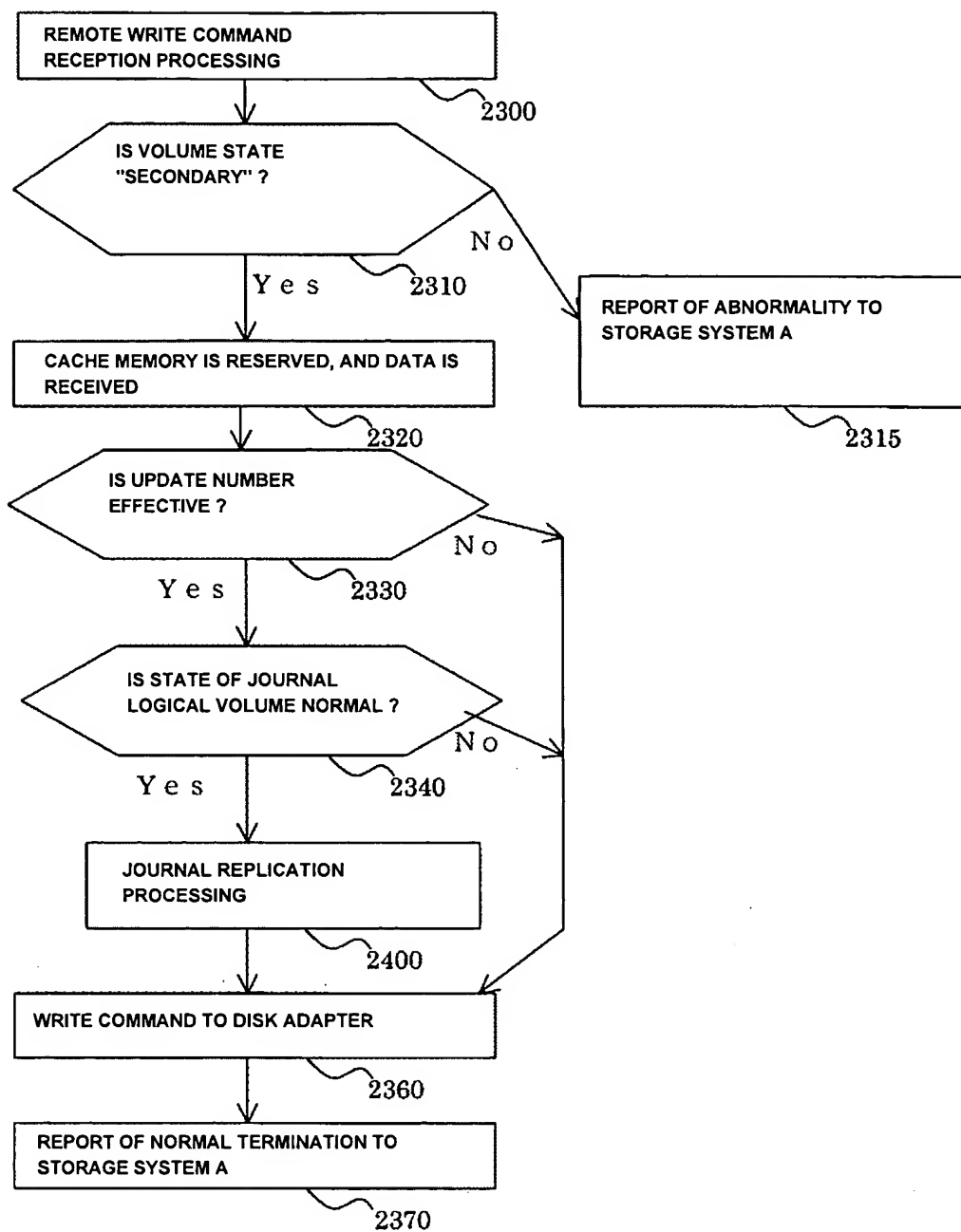


FIG. 24

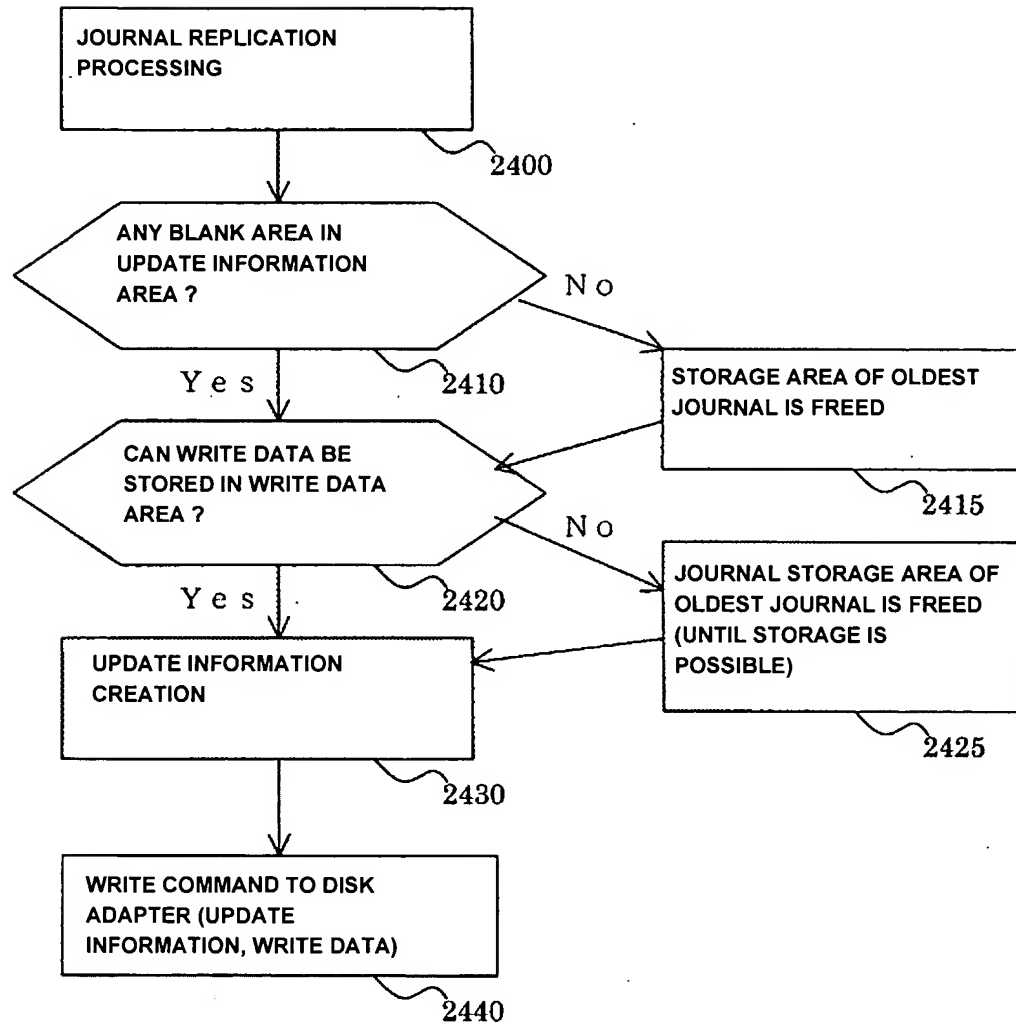


FIG. 25

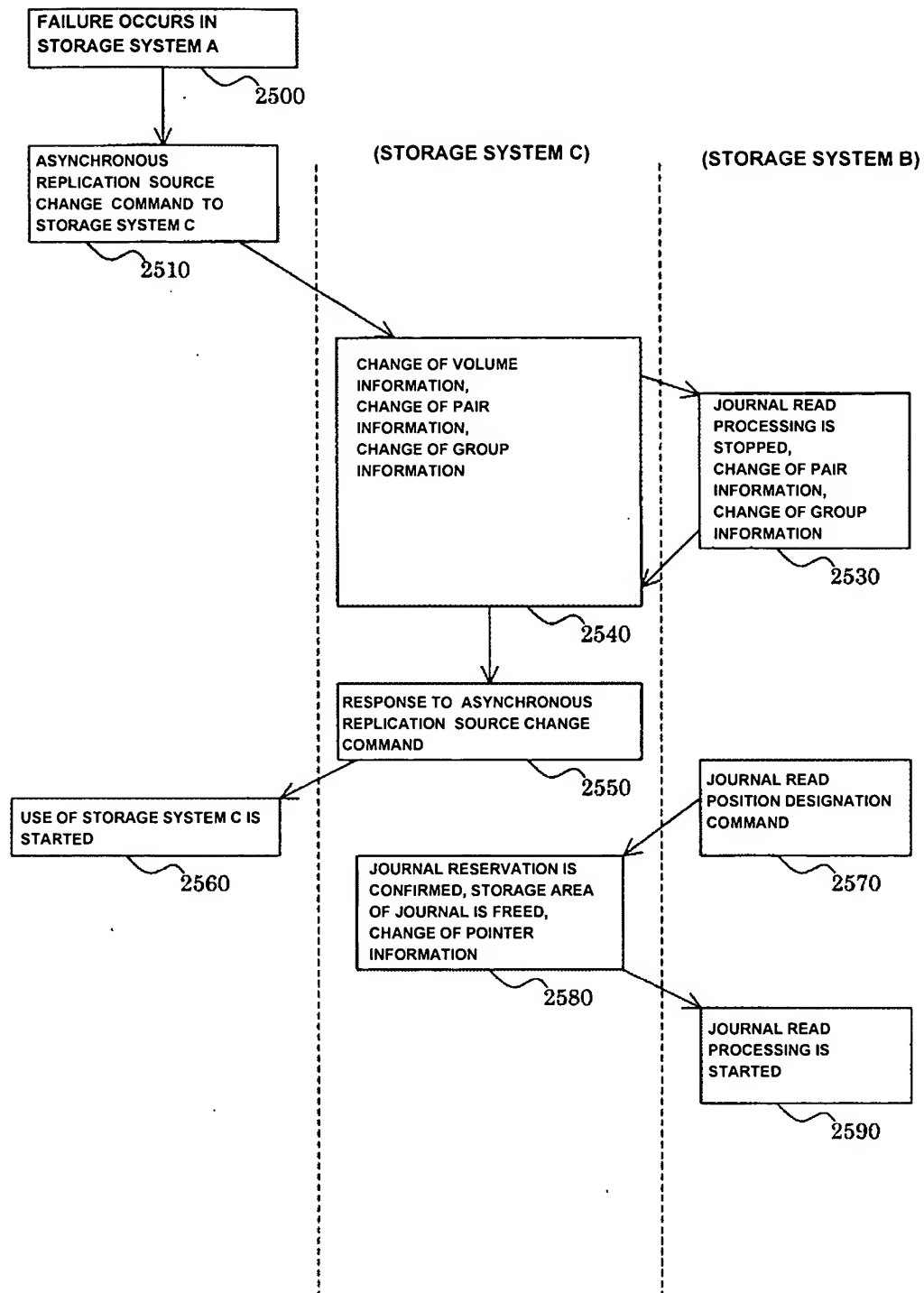


FIG. 26

LOGICAL VOLUME NUMBER	VOLUME STATE	FORMAT	CAPA- CITY	SYNC PAIR NUMBER	ASYN PAIR NUMBER	PHYSICAL ADDRESS	
						STORAGE DEVICE NUMBER	POSITION FROM THE HEAD
1	SECONDARY	OPEN3	3	0	1	1	0
2	SECONDARY	OPEN6	6	0	2	1	3
3	NORMAL	OPEN9	9	0	0	2	0

FIG. 27

PAIR NUMBER	PAIR STATE	PRIMARY STORAGE SYSTEM NUMBER	PRIMARY LOGICAL VOLUME NUMBER	SECONDARY STORAGE SYSTEM NUMBER	SECONDARY LOGICAL VOLUME NUMBER	GROUP NUMBER	COPY COMP- LETED ADDRESS
1	NORMAL	A	1	B	1	1	0
2	NORMAL	A	2	B	2	1	0
3	BLANK	0	0	0	0	0	0

FIG. 28

GROUP NUMBER	GROUP STATE	PAIR SET	JOURNAL LOGICAL VOLUME NUMBER	UPDATE NUMBER	REPLI- CATION TYPE	PARTNER STORAGE SYSTEM NUMBER	PARTNER GROUP NUMBER
1	NORMAL	1,2	3	4	ASync	A	1
2	BLANK	0	0	0	0	0	0

FIG. 29

	LOGICAL ADDRESS	
	LOGICAL VOLUME NUMBER	POSITION FROM THE HEAD OF STORAGE AREA OF LOGICAL VOLUME
UPDATE INFORMATION AREA HEAD ADDRESS	3	0
WRITE DATA AREA HEAD ADDRESS	3	700
UPDATE INFORMATION LATEST ADDRESS	3	400
UPDATE INFORMATION OLDEST ADDRESS	3	200
WRITE DATA LATEST ADDRESS	3	2000
WRITE DATA OLDEST ADDRESS	3	1300
READ INITIATION ADDRESS	3	0
RETRY INITIATION ADDRESS	3	0

FIG. 30

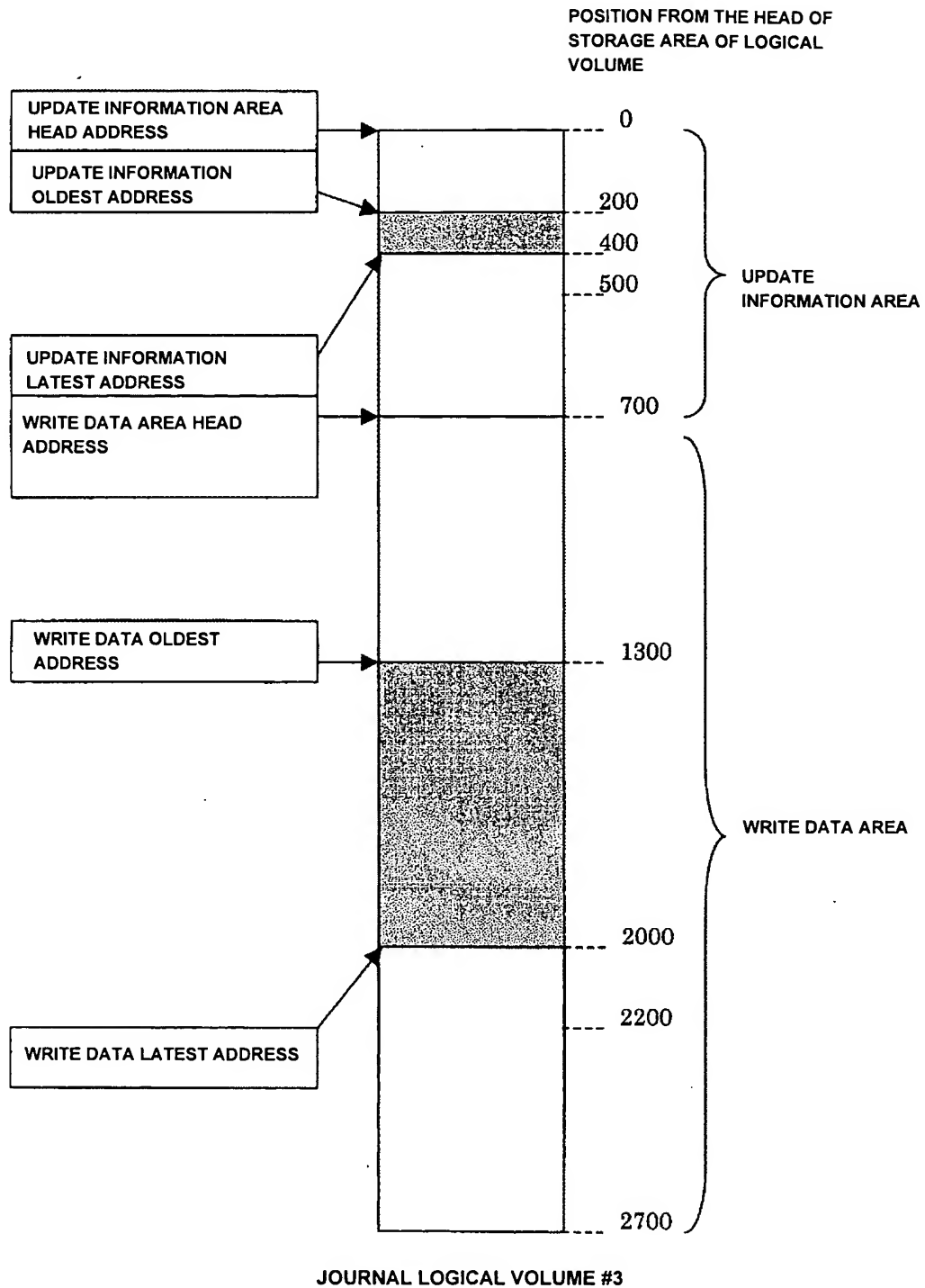


FIG. 31

LOGICAL VOLUME NUMBER	VOLUME STATE	FORMAT	CAPA- CITY	SYNC PAIR NUMBER	ASYNCR PAIR NUMBER	PHYSICAL ADDRESS	
						STORAGE DEVICE NUMBER	POSITION FROM THE HEAD
1	SECONDARY	OPEN3	3	1	0	1	0
2	SECONDARY	OPEN6	6	2	0	1	3
3	NORMAL	OPEN9	9	0	0	2	0

FIG. 32

PAIR NUMBER	PAIR STATE	PRIMARY STORAGE SYSTEM NUMBER	PRIMARY LOGICAL VOLUME NUMBER	SECONDARY STORAGE SYSTEM NUMBER	SECONDARY LOGICAL VOLUME NUMBER	GROUP NUMBER	COPY COMPL- LETED ADDRESS
1	NORMAL	A	1	C	1	1	0
2	NORMAL	A	2	C	2	1	0
3	BLANK	0	0	0	0	0	0
3	BLANK	0	0	0	0	0	0

FIG. 33

GROUP NUMBER	GROUP STATE	PAIR SET	JOURNAL LOGICAL VOLUME NUMBER	UPDATE NUMBER	REPLI- CATION TYPE	PARTNER STORAGE SYSTEM NUMBER	PARTNER GROUP NUMBER
1	NORMAL	1,2	3	5	SYNC	A	2
2	BLANK	0	0	0	0	0	0

FIG. 34

	LOGICAL ADDRESS	
	LOGICAL VOLUME NUMBER	POSITION FROM THE HEAD OF STORAGE AREA OF LOGICAL VOLUME
UPDATE INFORMATION AREA HEAD ADDRESS	3	0
WRITE DATA AREA HEAD ADDRESS	3	700
UPDATE INFORMATION LATEST ADDRESS	3	500
UPDATE INFORMATION OLDEST ADDRESS	3	0
WRITE DATA LATEST ADDRESS	3	2200
WRITE DATA OLDEST ADDRESS	3	700
READ INITIATION ADDRESS	3	0
RETRY INITIATION ADDRESS	3	0

FIG. 35

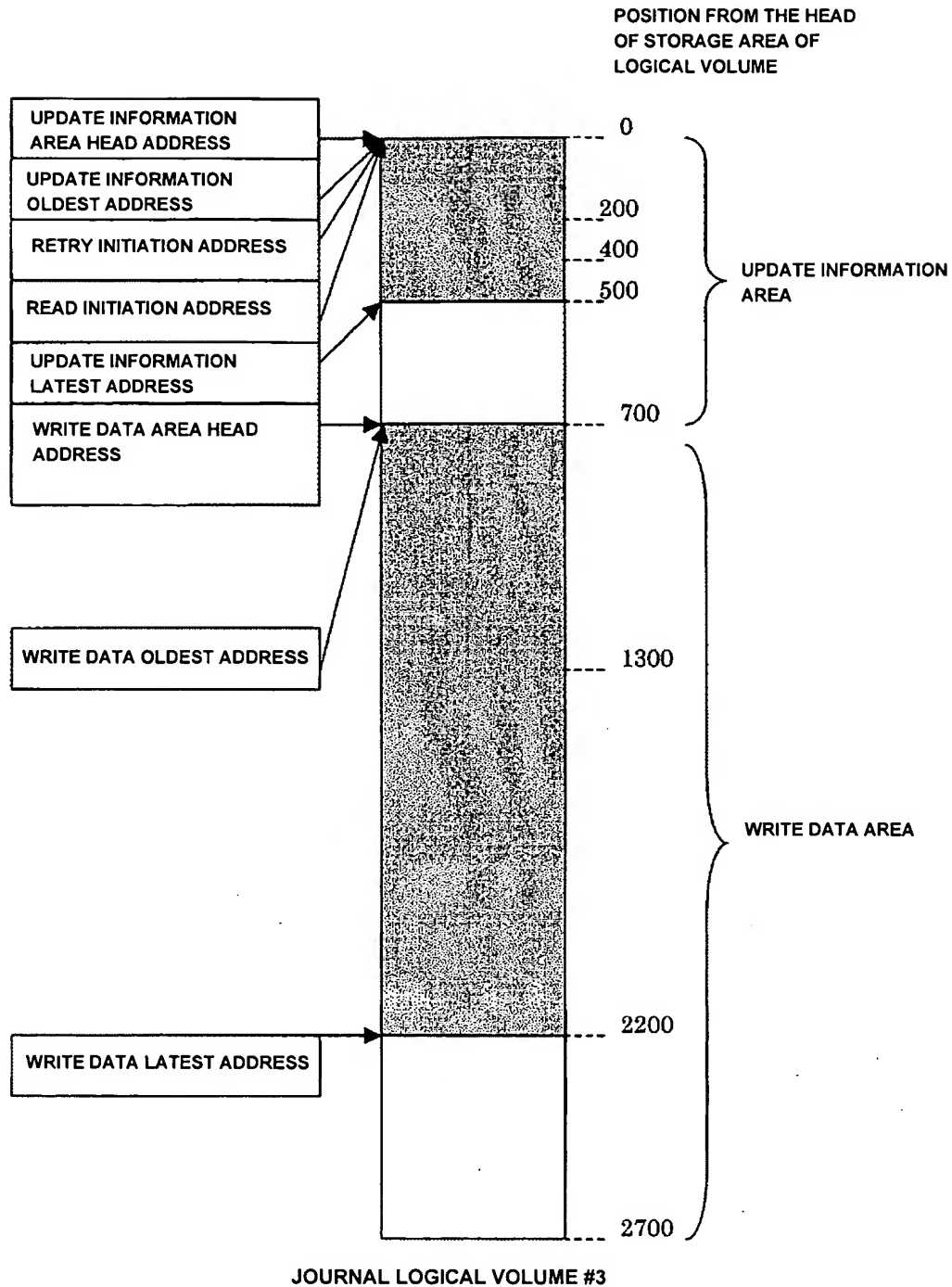


FIG. 36

PAIR NUMBER	PAIR STATE	PRIMARY STORAGE SYSTEM NUMBER	PRIMARY LOGICAL VOUME NUMBER	SECONDARY STORAGE SYSTEM NUMBER	SECONDARY LOGICAL VOUME NUMBER	GROUP NUMBER	COPY COMP- LETED ADDRESS
1	NORMAL	C	1	B	1	1	0
2	NORMAL	C	2	B	2	1	0
3	BLANK	0	0	0	0	0	0

FIG. 37

GROUP NUMBER	GROUP STATE	PAIR SET	JOURNAL LOGICAL VOLUME NUMBER	UPDATE NUMBER	REPLI- CATION TYPE	PARTNER STORAGE SYSTEM NUMBER	PARTNER GROUP NUMBER
1	HALTED	1,2	3	4	ASync	C	2
2	BLANK	0	0	0	0	0	0

FIG. 38

LOGICAL VOLUME NUMBER	VOLUME STATE	FORMAT	CAPA- CITY	SYNC PAIR NUMBER	ASYNCR PAIR NUMBER	PHYSICAL ADDRESS	
						STORAGE DEVICE NUMBER	POSITION FROM THE HEAD
1	PRIMARY	OPEN3	3	1	3	1	0
2	PRIMARY	OPEN6	6	2	4	1	3
3	NORMAL	OPEN9	9	0	0	2	0

FIG. 39

PAIR NUMBER	PAIR STATE	PRIMARY STORAGE SYSTEM NUMBER	PRIMARY LOGICAL VOLUME NUMBER	SECONDARY STORAGE SYSTEM NUMBER	SECONDARY LOGICAL VOLUME NUMBER	GROUP NUMBER	COPY COM- PLETED ADDRESS
1	ABNORMAL	A	1	C	1	1	0
2	ABNORMAL	A	2	C	2	1	0
3	NORMAL	C	1	B	1	1	0
4	NORMAL	C	2	B	2	1	0

FIG. 40

GROUP NUMBER	GROUP STATE	PAIR SET	JOURNAL LOGICAL VOLUME NUMBER	UPDATE NUMBER	REPLI- CATION TYPE	PARTNER STORAGE SYSTEM NUMBER	PARTNER GROUP NUMBER
1	ABNORMAL	1,2	0	5	SYNC	A	2
2	NORMAL	3,4	3	5	ASYNCR	B	1

FIG. 41

	LOGICAL ADDRESS	
	LOGICAL VOLUME NUMBER	POSITION FROM THE HEAD OF STORAGE AREA OF LOGICAL
UPDATE INFORMATION AREA HEAD ADDRESS	3	0
WRITE DATA AREA HEAD ADDRESS	3	700
UPDATE INFORMATION LATEST ADDRESS	3	500
UPDATE INFORMATION OLDEST ADDRESS	3	400
WRITE DATA LATEST ADDRESS	3	2200
WRITE DATA OLDEST ADDRESS	3	2000
READ INITIATION ADDRESS	3	400
RETRY INITIATION ADDRESS	3	400

FIG. 42

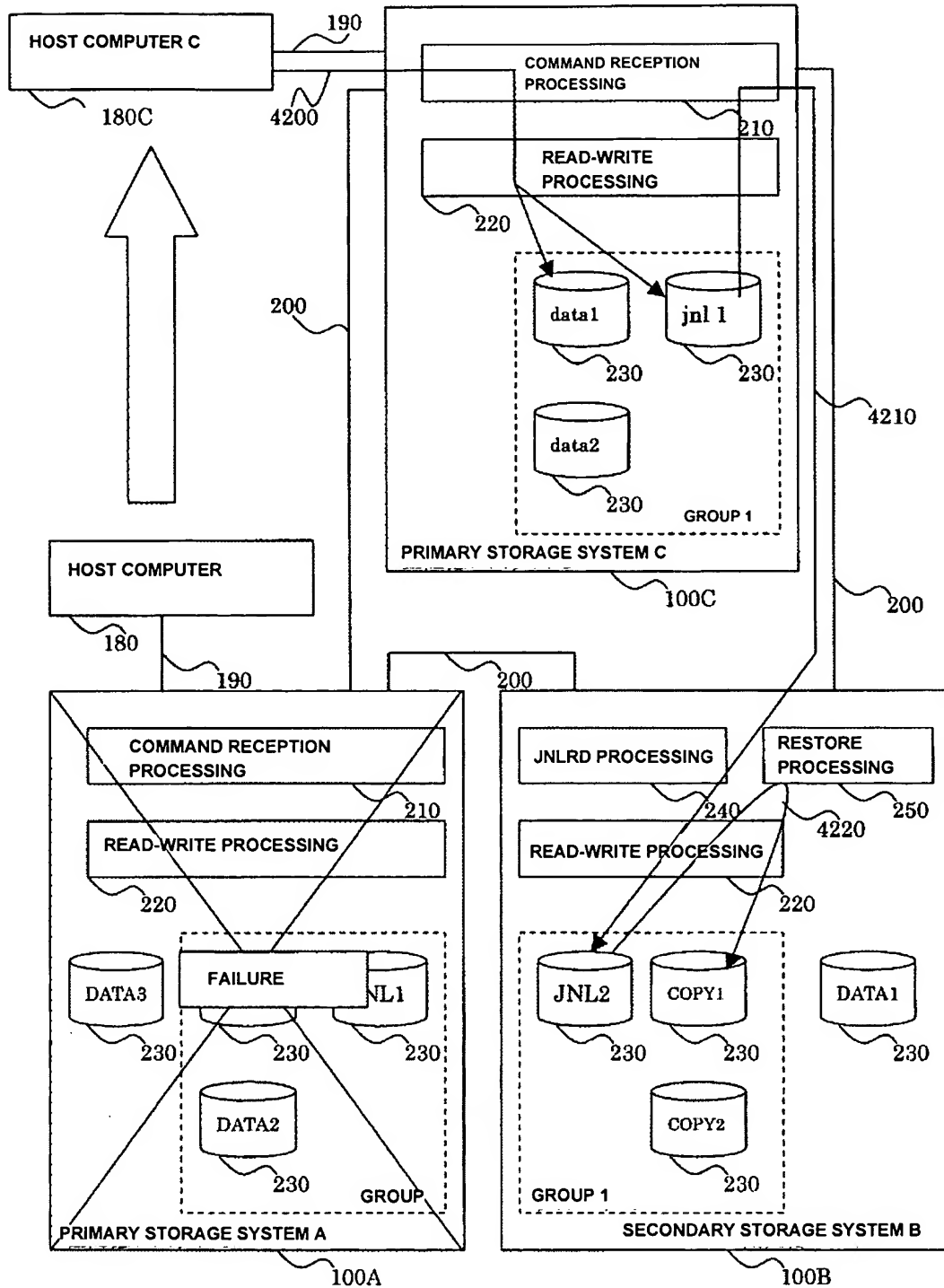


FIG. 43

PAIR NUMBER	PAIR STATE	PRIMARY STORAGE SYSTEM NUMBER	PRIMARY VOLUME NUMBER	SECONDARY STORAGE SYSTEM NUMBER	SECONDARY VOLUME NUMBER	GROUP NUMBER	COPY COMPLETED ADDRESS
1	NORMAL	C	1	A	1	1	0
2	NORMAL	C	2	A	2	1	0
3	NORMAL	C	1	B	1	1	0
4	NORMAL	C	2	B	2	1	0

FIG. 44

GROUP NUMBER	GROUP STATE	PAIR SET	JOURNAL LOGICAL VOLUME NUMBER	UPDATE NUMBER	REPLICATION TYPE	PARTNER STORAGE SYSTEM NUMBER	PARTNER GROUP NUMBER
1	NORMAL	1,2	0	5	SYNC	A	2
2	NORMAL	3,4	3	5	ASync	B	1

FIG. 45

LOGICAL VOLUME NUMBER	VOLUME STATE	FORMAT	CAPACITY	SYNC PAIR NUMBER	ASync PAIR NUMBER	PHYSICAL ADDRESS	
						STORAGE DEVICE NUMBER	POSITION FROM THE HEAD
1	SECONDARY	OPEN3	3	3	0	1	0
2	SECONDARY	OPEN6	6	4	0	1	3
3	BLANK	OPEN6	6	0	0	1	9
4	NORMAL	OPEN9	9	0	0	2	0
5	NORMAL	OPEN3	3	0	0	2	9
6	BLANK	OPEN6	6	0	0	2	12

FIG. 46

PAIR NUMBER	PAIR STATE	PRIMARY STORAGE SYSTEM NUMBER	PRIMARY LOGICAL VOLUME NUMBER	SECONDARY STORAGE SYSTEM NUMBER	SECONDARY LOGICAL VOLUME NUMBER	GROUP NUMBER	COPY COMP- LETED ADDRESS
1	BLANK	A	1	B	1	1	0
2	BLANK	A	2	B	2	1	0
3	NORMAL	C	1	A	1	2	0
4	NORMAL	C	2	A	2	2	0
5	BLANK	0	0	0	0	0	0

FIG. 47

GROUP NUMBER	GROUP STATE	PAIR SET	JOURNAL LOGICAL VOLUME NUMBER	UPDATE NUMBER	REPLI- CATION TYPE	PARTNER STORAGE SYSTEM NUMBER	PARTNER GROUP NUMBER
1	BLANK	1,2	0	5	ASYN	B	1
2	NORMAL	3,4	4	5	SYNC	C	1

FIG. 48

